

San Joaquin Renewables Class VI Permit Application Emergency and Remedial Response Plan

Prepared for

San Joaquin Renewables LLC
McFarland, California

Submitted to

U.S. Environmental Protection Agency Region 9
San Francisco, California

Prepared by



DBS&A
Daniel B. Stephens & Associates, Inc.

a Geo-Logic Company

43 Randolph Road, #129
Silver Spring, Maryland 20904
www.dbstephens.com
Project # DB19.1252.SS

October 22, 2021

Table of Contents

1.	Introduction.....	1
2.	Area Resources and Infrastructure.....	2
3.	Identification of Adverse Events.....	3
4.	Personnel Training and Equipment	4
5.	Emergency and Remedial Response Actions.....	4
5.1	Emergency Notification Contacts.....	5
5.2	Stakeholder Communication Plan.....	6
6.	Plan Updates or Amendments.....	7
	References.....	8

List of Figures

- 1 Site Location and Features
- 2 Area Resources and Infrastructure

List of Tables

- 1 Area Resources and Infrastructure
- 2 Adverse Event and Emergency Response Procedures

1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this Class VI Emergency and Remedial Response Plan (Plan) per 40 CFR 146.94(a) and United States Environmental Protection Agency (EPA) guidance (2010; 2012, 2013a; 2013b) for the proposed San Joaquin Renewables (SJR) facility near McFarland, California (Figure 1). SJR is proposing to construct and operate a facility that will convert agricultural waste biomass into about 80 thousand gasoline gallon-equivalents of natural gas (RNG) per day. The RNG will be transported by pipelines to be used as vehicle fuel throughout California. Biomass feedstock used in the plant will consist of approximately 1,000 tons per day of agricultural wood waste, pistachio shells, and almond shells (SJR, 2020).

Carbon dioxide (CO₂) is a byproduct of the final cleaning step in the gasification process. SJR will operate a carbon capture and geologic sequestration (CCS) facility adjacent to the RNG plant to capture and store CO₂ deep underground. Captured vapor-phase CO₂ from the plant will be condensed, liquefied, and pumped into the subsurface using a USEPA Class VI vertical geologic sequestration injection well installed approximately 8,700 feet below ground surface (bgs). The geologic environment of the injection site has been specifically selected per USEPA guidance and permitting requirements (EPA, 2010; 2013a) to appropriately receive and contain the injected CO₂.

This plan describes the emergency and response procedures that SJR facility operators would undertake to address an adverse event or emergency associated with injection activities at the CCS facility. The plan describes procedures for the CCS facility itself but not for the adjacent RNG plant that is separately operated. Also, natural disasters or other events such as fire, flood, storm, or power outage are not addressed in this plan. The plan specifically addresses potential issues or events that may pose a threat to underground sources of drinking water (USDW) or area resources and infrastructure within the facility's defined Area-of-Review (AoR). This includes, but is not limited to, residences, businesses, public facilities, commercial facilities, roads, and natural resources such as streams or habitat.

The AoR is the land and subsurface space surrounding the injection site where USDWs may be potentially endangered by the injection activity. The AoR is defined as the area where carbon dioxide is projected to migrate and where reservoir pressure ("pressure front") will be increased to the extent that fluids may theoretically intrude into overlying USDWs if a preferred pathway is

present (e.g., fault or improperly abandoned well). The AoR was delineated using computational modeling that accounts for the physical and chemical properties of the injected CO₂ stream and displaced fluids, and is based on available site characterization, monitoring, and operational data (see the AoR and Corrective Action Plan). The AoR covers 73 square miles or approximately 46,900 acres of land near McFarland, California just south of Elmo Highway between State Route 43 and State Route 99 (Figure 2). The area is approximately 12.5 miles long by 7.5 miles wide.

The plan will be reviewed and/or updated at least on an annual basis. The intent of the plan is to identify potential emergency scenarios, develop personnel training, identify area resources and infrastructure to be protected, develop appropriate response actions, present emergency contacts, and develop a stakeholder communication plan. Per EPA guidance (EPA, 2012), the plan currently consists of the following primary elements described in the sections below:

- Area Resources and Infrastructure
- Identification of Adverse Events
- Personnel Training and Equipment
- Emergency and Remedial Response Actions

This plan will also be implemented concurrently with a plant Health and Safety Plan and plant operations manual prepared under separate cover.

2. Area Resources and Infrastructure

Figure 2 shows the major features currently identified within the AoR. The nearby City of McFarland and unincorporated communities are shown along with area schools, hospitals, roads, bridges, public water supply wells, various public facilities, oil and gas wells, and surface water features, including:

- 4 public water supply wells
- 19 oil and gas wells
- 1 hospital
- 9 schools
- 1 airport
- 1 railroad line
- 2 fire stations

The land within the AoR is mainly used for agriculture with some rural residences and local businesses and commercial properties. The City of McFarland is the largest developed area with unincorporated communities nearby such as Delano, Elmo, Pond, Vinland, Zentner, Hollis and Calico. In addition, the alluvium (San Joaquin Valley groundwater basin and Kern County subbasin) contains the USDW within the project AoR. Depth-to-USDW is approximately 2,400 ft bgs at the Facility location and ranges from 2,100 ft bgs to 2,900 ft bgs within the AoR. Table 1 itemizes the identified resources and infrastructure within the AoR.

Post-construction, this plan will be updated (Section 6), once new pre-injection data are available, to include additional information regarding formation geochemistry that may affect groundwater or surface water quality.

3. Identification of Adverse Events

SJR recognizes the following major adverse events or emergencies, however unlikely, may occur at the injection facility or within the AoR including:

- Injection well failure (leaking injection well or blowout)
- Unexpected carbon dioxide or formation fluid migration (through faults, fractures or wells)
- Unexpected carbon dioxide accumulation in indoor air
- Groundwater or surface water contamination

Injection well failure includes well casing collapse, well blowout or lesser events such as loss of injection pressure or failure and shutdown of critical monitoring instrumentation.

Each of these events are considered unlikely or improbable; however, SJR is prepared to address each one or multiple simultaneous events as needed. Event risk and emergency and remedial response actions associated with injection activities is discussed in Section 5.

4. Personnel Training and Equipment

Facility personnel will be properly trained with regard to this plan and companion facility safety or operations plans before injection commences. As noted above this plan is envisioned to be implemented in companion with the plant Health and Safety Plan and master facility operations manual. In addition, facility personnel will be trained to communicate and coordinate in advance with local first-responder personnel.

Training will be updated at least on an annual basis. Mid-year training updates may also be completed as needed if additional equipment or procedures are introduced to facility operations as routine, periodic, or one-time occurrences.

Training will include designation of an onsite plant emergency coordinator and explanatory instruction regarding emergency command center location(s); facility configuration, regular plant operational procedures, safety zones, emergency meeting areas, required equipment, equipment access and storage; Health and Safety plan overview, emergency and remedial response procedures and plan overview, emergency contacts, chain-of-command decision-making, facility shutdown and startup, and related information. A personnel record will be maintained to document completed training and updates. Training will be conducted by appropriate facility operations management, safety professionals, or their designee.

A specialty subcontractor will be on-call to address potential injection well blowout, injection well casing failure, or another similar event. SJR recognizes this is a unique event that requires specialty expertise and subcontractors to rapidly evaluate the issue, provide recommendations, and implement a suitable remedy in the field.

5. Emergency and Remedial Response Actions

The goal of remedial response is to determine the cause of the issue, implement an appropriate remedy, and prevent or minimize any recurrence. The response to each adverse event commences with the same initial actions:

- Stop injection (implement Shut-down Procedure [Section 6])
- Notify emergency contacts
- Conduct causal investigation

- Develop and implement correction action

Table 2 presents more specific emergency response actions that will be taken for each primary type of identified emergency or adverse event at the facility. The probability of occurrence of each event (occurrence risk) is considered relatively low. In addition, the likelihood of severe consequences (severity risk) is also considered relatively low. Occurrence risk and severity risk are not further distinguished between the potential emergencies or events. All potential events will be considered equally important in the remedial response and decision-making process.

The response to each event will be inherently event-specific, that is, the response will be expected to be both proactive and reactive as the issue is identified, as understanding evolves, and as the issue is addressed and remedied. Site-specific investigations, monitoring, or abatement will need to be implemented on an expedited schedule. Depending on the individual event, some tasks may need to be addressed on a continual 24-hour per day basis until the issue is resolved.

An investigation report will be prepared to document the event, investigation methods and results, and corrective action undertaken to address identified issues.

5.1 Emergency Notification Contacts

The list of current emergency contacts for adverse injection events is presented below. (Note this list will be updated as needed):

Underground Injection Control (UIC) Program Director (required within 24 hours)	David Albright, USEPA, 415 972-3971
Fire or Medical Emergency	911
Well Blowout	On-call Contractor TBD
Well Casing Failure	On-call Contractor TBD
SJR Program Manager	Thomas Paskach, 515-231-7743
SJR Operations Manager	Arlon Binning, 515-263-6334
Onsite Plant Operations Manager	Will be completed

Onsite Plant Safety Officer

Will be completed

USEPA Project contact

David Albright, USEPA, 415 972-3971

Other contacts as needed:

Driltek

(661) 327-3021

901 Tower Way, Suite 102, Bakersfield, CA 93309

Kern County Fire Station 33

(661) 758-6447

401 Kern Ave, McFarland, CA

911

McFarland Police Department

(661) 792-2121

401 Kern Ave, McFarland, CA

911

Kern County Sheriff

(661) 861-3110

1350 Norris Road, Bakersfield, CA

911

5.2 Stakeholder Communication Plan

Stakeholder communication can be engaged at various stages in the event evaluation, response action, or remedial process as deemed appropriate. The intent of the stakeholder communication plan is to deliver clear and timely project information to interested community members and first-responder personnel that may be involved in the event of a remedial process. This information will be delivered before injections commence as well as in the unlikely occurrence of an adverse event or emergency. The stakeholder communication plan consists of the following elements:

- Community Meetings
- Update Meetings
- Contact Information

Before injections commence, a neighborhood community meeting will be held jointly with the City of McFarland. The meeting will be held to inform residences, businesses, police/fire personnel within the AoR and/or others of the project background, operations, and schedule of

upcoming activities such as plant construction or injection. Typically, such information would be provided in slideshow or visual presentation format with appropriate figures, diagrams, and related summary information for handouts. The initial meeting materials will provide phone and email address information for designated SJR contacts to develop an ongoing two-way line of communication.

As community interest dictates, additional, update meetings may be held to present and discuss the details of adverse events that may have occurred. In addition, as further community interest dictates, update meetings may be held annually to inform the community of project milestones and accomplishments as well as any adverse events. A list of interested community members and their affiliation and contact information may be developed and maintained as project needs or community interest dictates.

6. Plan Updates or Amendments

This plan will be reviewed and updated as needed at least on an annual basis. Plan updates may include additional or alternative project personnel, information regarding plant upgrades, expansions, or modifications, a summary of past adverse events and remedial responses, AoR updates, remedial response effectiveness, plan improvements, communication procedures, lessons learned, or other relevant information. Updates may also be periodically appropriate to identify supplemental remedial response actions, equipment, or personnel training.

Post-construction, this plan will be updated to include injection well construction information, schematics, and emergency shutoff controls and instrumentation. A step-by-step injection well shut-down procedure will also be included as a section of the plan as needed. Facility reference schematics and maps will also be included.

References

United States Environmental Protection Agency (EPA), 2010. Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells Final Rule. URL: <https://www.epa.gov/uic/federal-requirementsunder-underground-injection-control-uic-program-carbon-dioxide-co2-geologic>.

EPA, 2012. Geologic Sequestration of Carbon Dioxide, Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance. EPA 816-R-11-017, Office of Water (4606M), Washington, D.C., August 12.

EPA, 2013a. Geologic Sequestration of Carbon Dioxide Underground Injection Control (UIC) Program Class VI Well Site Characterization Guidance. EPA 816-R-13-004. URL: <https://www.epa.gov/uic/final-class-vi-guidance-documents>.

EPA, 2013b. Geologic Sequestration of Carbon Dioxide Underground Injection Control (UIC) Program Class VI Well Area of Review Evaluation and Corrective Action Guidance. EPA 816-R-13-005. URL: <<https://www.epa.gov/uic/final-class-vi-guidance-documents>>





40 CFR 146.94. Code of Federal Regulations, Title 40, Protection of Environment, Part 146, "Underground Injection Control Program: Criteria and Standards," Section 94, "Emergency and remedial response."

Figures

K:\PROJECTS\ENVIRONMENTAL SERVICES\PRIVATE\FRONTLINE BIOENERGY\GIS\MXD\FIGURES_2021-06\FIG01_SITE_LOCATION_FEATURES.MXD



Explanation






-  SJR Property boundary
-  Quaternary fault
-  Pre-Quaternary fault
-  Pond fault

Sources:
1. Faults from Fault Activity Map of California, Department of Conservation, California Geological Survey, 2010.
2. Property boundaries from Kern County Assessor, 2018.
3. 2016 aerial imagery from USDA NAIP.





**SAN JOAQUIN RENEWABLES
Site Location and Features**



 SJR Property
 AoR, 15 and 20-year combined
 AoR-5-year
 City boundary
 Lake/Pond/Reservoir

 Major highway or road
 Railroads
 Pre-Quaternary fault
 Quaternary fault
 River

- DWR public water supply well
- DOGGR oil/gas well
- Waste water treatment plant
- Transmitting station
- Fire station

-  School
-  Hospital
-  Police
-  Airport

Sources:

1. DOGGR wells from Division of Oil, Gas, and Geothermal Resources.
2. Public supply wells from CA DWR.
3. Property boundary from Kern County Assessor, 2018.
4. U.S. Geological Survey Topographic Map and ESRI

Notes:

1. AoR = Area of review

SAN JOAQUIN RENEWABLES Area Resources and Infrastructure

Tables

Table 1a. Facilities

Category	Name	Address	City	Zip Code	Phone	AoR 5-Year	AoR 15/20-Year
School	Pond Elementary School	29585 Pond Road	Wasco	93280	661-792-2545		X
School	Browning Road Elementary School	410 E Perkins Ave	McFarland	93250	661-792-2113	X	
School	Kern Avenue Elementary School	356 W Kern Ave	McFarland	93250	661-792-3033	X	
School	McFarland Middle School	405 Mast Ave	McFarland	93250	661-792-3340	X	
School	McFarland High School	259 W Sherwood Ave	McFarland	93250	661-792-3126	X	
School	San Joaquin High School	599 5th Street	McFarland	93250	661-792-6312	X	
School	Delano Head Start Center	625 14th Ave	Delano	93215	661-720-9550		X
School	Valle Vista School	120 Garces Hwy	Delano	93215	661-721-5070		X
Hospital	Browning Manor Convalescent Hospital	729 Browning Road	Delano	93215	661-725-2501		
Hospital	Delano Hospital (Urgent Care)	1201 Jefferson Street	Delano	93215	661-725-2579		
Hospital	Delano Regional Medical Center	1401 Garces Hwy	Delano	93215	661-725-4800		X
Airport	Delano Municipal Airport	1212 Airport Drive	Delano	93215	661-721-3338		X
Airport	Wasco-Kern County Airport				661-391-1800		
Fire station	Kern County Fire Station 34	1001 12th Ave	Delano	93215	661-725-1000		
Fire station	Kern County Fire Station 33	700 W Perkins Ave	McFarland	93250	661-792-2131	X	
Fire station	Kern County Fire Station 37	132 W 11th Ave	McFarland	93215	661-725-2222		X
WWTP	Delano Waste Treatment Plant	1107 Lytle Ave	Delano	93215	661-721-3352		
Transmitting station	Delano Transmitting Station	11015 Melcher Road	Delano	93215	661-725-0150		X
Police/Sheriff	Mc Farland Police Department	401 W Kern Ave	McFarland	93250	661-792-2121		
Police/Sheriff	Kern County Sheriff's Department	455 Lexington Street	Delano	93215	661-721-3800		X

Table 1b. Wells

Source	Type	MTRS	API	Lease Name	Well Number	Well Status	Operator Name	Section	Township	Range	Latitude	Longitude	AoR 5-year	AoR 15/20-year
DOGGR	Oil/gas		402930513	E.C. Cozart	1	Plugged	Marathon Oil Company	31	25S	25E	35.71146	-119.318		X
DOGGR	Oil/gas		402930514	Williams	1	Plugged	Getty Reserve Oil, Co.	26	25S	25E	35.72866	-119.254		X
DOGGR	Oil/gas		402930515	Davis	1	Plugged	Getty Reserve Oil, Co.	35	25S	25E	35.71451	-119.254	X	
DOGGR	Oil/gas		402930516	Stiles	1	Plugged	Getty Reserve Oil, Co.	35	25S	25E	35.7038	-119.258	X	
DOGGR	Oil/gas		402930522	Curry	1	Plugged	Shell Western E&P Inc.	20	25S	26E	35.73789	-119.198		X
DOGGR	Oil/gas		402930604	K.C.L. 25	1	Plugged	Mobil Oil Corporation	25	26S	25E	35.64264	-119.233	X	
DOGGR	Oil/gas		402930605	KCL	87-25	Plugged	Moriqui Exploration Co.	25	26S	25E	35.63395	-119.225		X
DOGGR	Oil/gas		402930607	Del Fortuna	1	Plugged	Atlantic Oil Company	21	26S	26E	35.64836	-119.182		X
DOGGR	Oil/gas		402930608	Lease by Chevron U.S.A. Inc.	32-15	Plugged	Chevron U.S.A. Inc.	15	26S	26E	35.67201	-119.164		X
DOGGR	Oil/gas		402930614	KCL	16X-30	Plugged	Trico Industries Inc	30	26S	26E	35.63549	-119.223		X
DOGGR	Oil/gas		402930615	Alta	1	Plugged	John H. Webb	16	26S	26E	35.67424	-119.178		X
DOGGR	Oil/gas		402930616	White-Harp	1	Plugged	C. C. White	9	26S	26E	35.68482	-119.171		X
DOGGR	Oil/gas		402959849	Nella	1	Plugged	Atha-Saris	2	26S	25E	35.7005	-119.246	X	
DOGGR	Oil/gas		402970053	Tenneco-Sun	11X-31	Plugged	Arco Western Energy Co.	31	26S	26E	35.63041	-119.223		X
DOGGR	Oil/gas		402979821	Lieber	1	Plugged	Arco Western Energy Co.	28	25S	25E	35.73082	-119.287		X
DOGGR	Oil/gas		402980729	Ingram	13-73	Plugged	Trio Petroleum LLC	13	26S	25E	35.6699	-119.226	X	
DOGGR	Oil/gas		402981541	Rosenberger	1	Plugged	Arco Western Energy Co.	5	26S	25E	35.70134	-119.31		X
DOGGR	Oil/gas		403003222	Parsons	1	Plugged	Dowser Exploration Venture	8	26S	26E	35.67514	-119.203		X
DOGGR	Oil/gas		403022505	Aztec	29-Jan	Plugged	Skyview Holdings, Inc.	29	25S	25E	35.72955	-119.294		X
DWR	Public water supply	M25S25E10							25S	25E10				X
DWR	Public water supply	M25S25E14							25S	25E14				X
DWR	Public water supply	M25S25E22							25S	25E22				X
DWR	Public water supply	M26S25E12							26S	25E12			X	

Table 2. Adverse Events and Emergency Response Procedures

Event	Response Action(s)
Injection well failure	<ul style="list-style-type: none"> ▪ Stop injection (implement Shut-down Procedure) ▪ Notify emergency contacts ▪ Conduct causal investigation ▪ Employ standard well blowout evaluation methodologies <ul style="list-style-type: none"> ○ Downhole logging/camera; interval testing; others ▪ Employ standard well blowout repair methodologies <ul style="list-style-type: none"> ○ Annular seal repair/replacement ○ Casing repair/replacement ○ Grout barrier ▪ Evaluate resumed injection at reduced pressure ▪ Engage stakeholder communication plan
Unexpected carbon dioxide migration	<ul style="list-style-type: none"> ▪ Stop injection (implement Shut-down Procedure) ▪ Notify emergency contacts ▪ Conduct causal investigation ▪ Conduct area survey to map leakage area ▪ Engage stakeholder communication plan ▪ Develop monitoring program ▪ Evaluate resumed injection at reduced pressure ▪ Implement monitoring during resumed injection
Unexpected carbon dioxide accumulation in indoor air	<ul style="list-style-type: none"> ▪ Stop injection (implement Shut-down Procedure) ▪ Notify emergency contacts ▪ Conduct causal investigation ▪ Conduct area survey to map leakage area ▪ Develop monitoring program (sensor deployment) ▪ Develop air abatement program (ventilation, scrubbing) ▪ Engage stakeholder communication plan ▪ Evaluate resumed injection at reduced pressure ▪ Implement monitoring during resumed injection
Groundwater or surface water contamination	<ul style="list-style-type: none"> ▪ Stop injection (implement Shut-down Procedure) ▪ Notify emergency contacts ▪ Conduct causal investigation ▪ Conduct area survey to map leakage area ▪ Develop water quality monitoring program ▪ Evaluate potential alternative remedial technologies ▪ Engage stakeholder communication plan ▪ Develop corrective action plan as needed ▪ Evaluate resumed injection at reduced pressure ▪ Implement monitoring during resumed injection